

etCIVIL AIR PATROL – ARUNDEL COMPOSITE SQUADRON

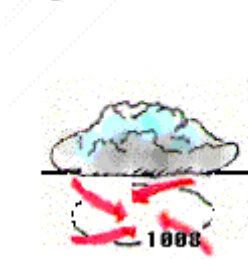
July 2004

SAFETY

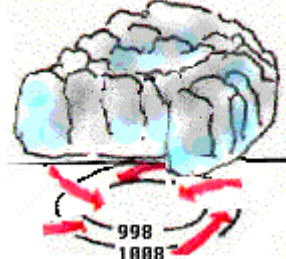
HURRICANES

Hurricanes start as a cluster of **thunderstorms** over the waters of the **tropical ocean**. Once a **tropical depression** forms, it can develop into a tropical storm in less than a couple of days. If this storm intensifies further, then it can develop into a **hurricane**. Heat (ocean water temperature above 80 °F) and moisture from the ocean is the **energy source** for these **storms**.

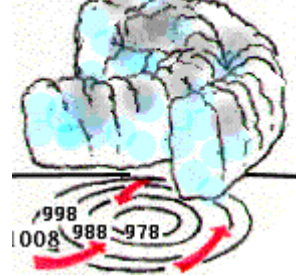
Depression



Tropical Storm



Hurricane



Tropical Depression:

Winds at 23-39 mph (20-34 knots)

Tropical Storms:

Winds at 39-73 mph (35-64 knots)

Storm is becoming organized and begins to form circular shape

Pressure at the center of the storm begins to drop

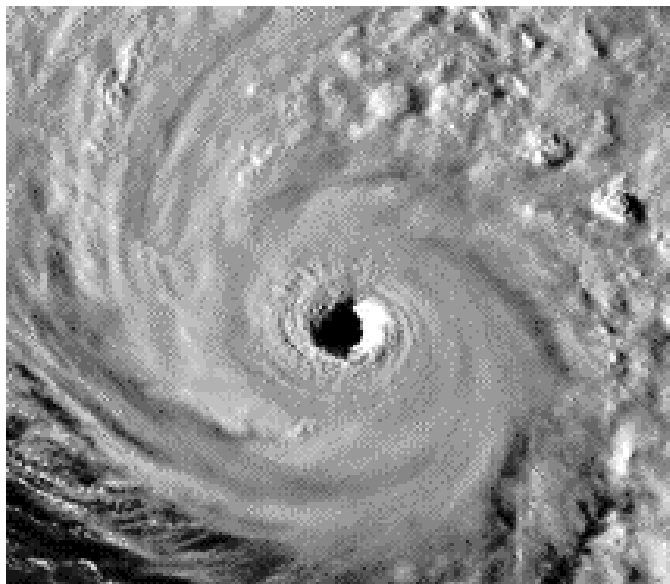
Hurricane:

Winds above 74 mph (64 knots)

Pronounced **rotation** develops around the central core

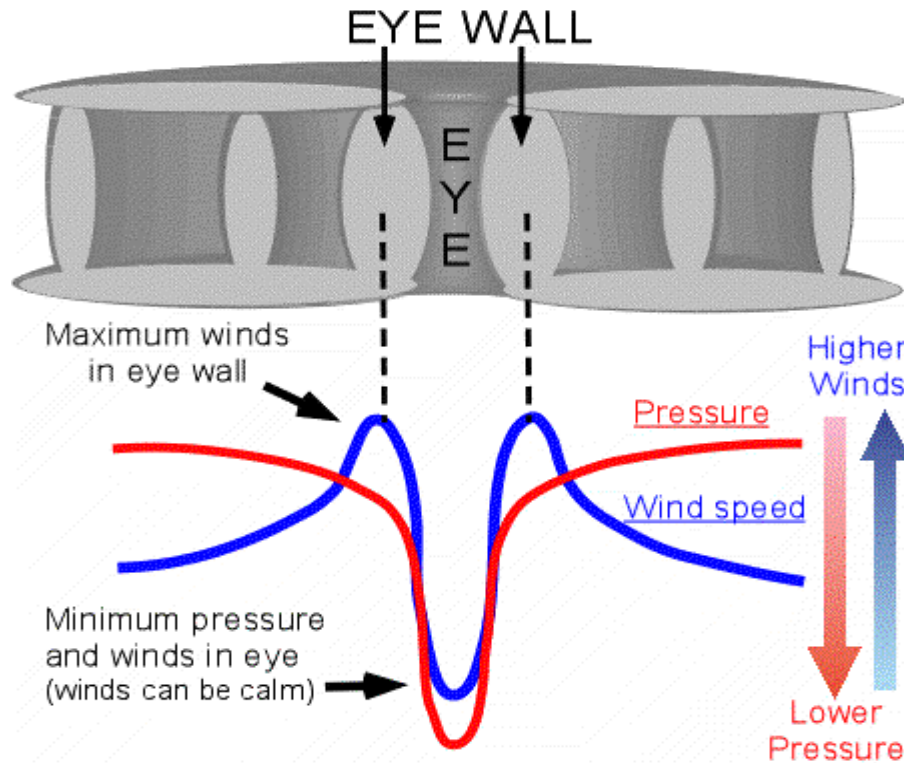
Surface pressure of the central core continues to drop

Hurricanes are **Earth's** strongest tropical cyclones. In the **Northern Hemisphere**, the rotation is **counter-clockwise**. In the **Southern Hemisphere**, the rotation is **clockwise**. A distinctive feature seen on many hurricanes is the dark spot found in the middle. This is called the **eye**.



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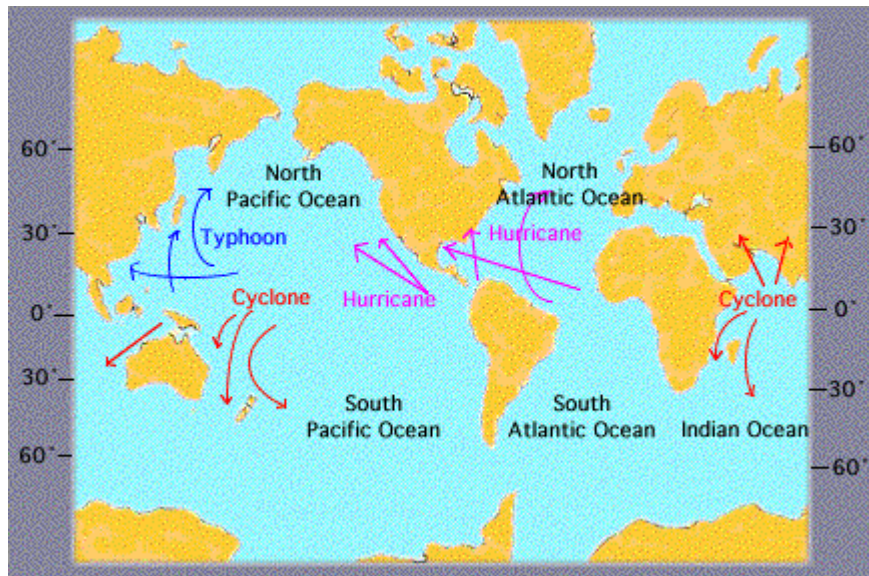
Surrounding the **eye** is the region of most intense winds and rainfall, called the eye wall. Large bands of clouds and precipitation spiral from the eye wall. These are called **spiral rain clouds**.



Between **100-200 kilometers** from the eye, the winds are fast enough to qualify as tropical storm force. As one gets closer to the **eye wall**, the atmospheric pressure gradually decreases, and the wind speed gradually increases. Within the eye wall itself, wind speed is at maximum, and atmospheric pressure is at minimum. At the **center of the eye**, however, both the wind speed and pressure are very low. This results in a relatively **calm** condition.

Hurricanes develop in the tropics, and travel northward on the east coast of the U.S., mostly from Florida through the Carolinas. Sometimes, however, hurricanes can travel even further up north. These storms have different names in different parts of the world, such as **typhoon** in the western Pacific and Indian Ocean, and **cyclone** at eastern Australia and eastern Africa.

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In 1805, the British Rear-Admiral, **Sir Francis Beaufort**, devised a scale to describe ocean storms, based on observations of the effects of the wind. This is known as the **Beaufort Wind Scale**. The scale ranges from 0 to 12, with some values as follows:

Beaufort Number	Wind Speed (knots)	Wave Height (ft)	Observed Effect on Sea
0	Less than 1	None	Calm; sea is like a mirror
6	22 - 27	9 - 13	Large waves forming; whitecaps everywhere
12	Greater than 64	Over 45	Hurricane strength winds, sea completely white with driving spray; visibility greatly reduced

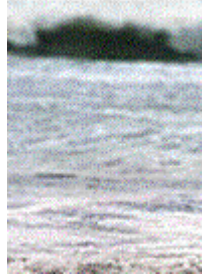
DAMAGE from HURRICANES

With hurricanes being as powerful as they are, it is not surprising that upon landfall, they cause damage and destruction. Even when the hurricane has yet to make landfall, its effects can be dangerous. Most of the damage caused to man and nature, however, occurs as a hurricane makes landfall. The damage comes from:

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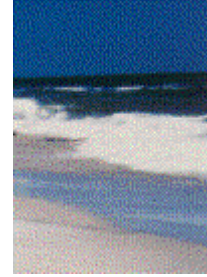
Strong winds



Storm surge



Flooding



Rip tides

- Strong winds:** These are the most common destructive forces associated with hurricanes. They can barrage and uproot trees, knock over buildings and homes, fling potentially deadly debris around, sink or ground boats, and flip cars. The [Saffir-Simpson Scale](#) categorizes hurricanes on a scale from 1 to 5. **Category 1** hurricanes are the weakest (wind speed at 64-82 knots; storm surge at 4-5 feet; some damage to trees, shrubbery, and unanchored mobile homes). **Category 5** hurricanes are the strongest (wind speed above 135 knots; storm surge above 18 feet; extensive damage to homes and industrial buildings, and can blow away small buildings)
- Storm surge:** Storm surge is the rising of the sea level due to the low atmospheric pressure, high winds, and high waves. Storm surge creates steady flooding, and can wreck homes and pull boats and cars inland or out to sea. Water that flow into low-lying areas can remain for weeks.
- Flooding:** Apart from the storm surge, heavy rainfall causes both flash floods and long term flooding. Hurricanes can dump ½-1 foot of rain in a few days. Flooding typically kills more people than strong winds from a hurricane.
- Rip tides:** Rip tides are strong sea currents that push away from the shore as a strong storm is near. The incoming waves create an underwater sandbar close to the shore. The waves push more and more water in-between the sandbar and the shore until a section of the sandbar collapses. This will create a strong but narrow current away from the shore. The rip tides are in fact so strong, that a swimmer is advised not to swim against it toward the shore, but to swim parallel to it until he/she is out of the current, and only then swim toward the shore.

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SAFETY in HURRICANES

If your home is on or near the coastline where the hurricane's destructive forces will affect it, pay close attention to what the local government and/or police force is recommending. With today's satellite technology, meteorologists can give adequate warning to the public about approaching hurricanes. Pay close attention to radio or TV stations for weather updates.

If evacuation of your home is recommended:

- Heed their warning!
- Plan ahead where you would go (it may be beneficial to choose a few places like an out of town friend's home or a designated shelter)
- Take phone numbers of these places with you
- Take a road map in case the weather forces you onto unfamiliar roads
- Do not drive over standing water, as floods may have damaged the roads, and you do not know how deep the water really is!

If you are in the path of a land-falling hurricane, you should prepare a supply kit containing:

- First aid kit and necessary medications
- Canned food and an opener, as this food lasts for long periods of time without needing refrigeration
- Plenty of water (the Red Cross recommends 3 gallons of water per person to last 3 days)
- Flashlight, a battery powered radio, and extra batteries
- Raingear, sleeping bags, and protective clothing

GET MORE INFORMATION

References:

1. <http://ww2010.atmos.uiuc.edu/>
2. <http://www.fema.gov/hazards/>
3. <http://www.redcross.org/>
4. <http://www.stormfax.com/>